breeding individuals tend to stay over within our limits.

The available data and our own intensive studies on the coast of Gujarat suggest that the gull is quite abundant on the Gulf of Kachchh, but not so on the Gulf of Khambat. One of us (Parasharya 1984) studied the coastal avifauna near Bhavnagar and Ghogha during 1979 to 1983, but had seen it only once. It is possible that the species was overlooked because of its similarities with the blackheaded gull *Larus ridibundus* in winter plumage (Ali and Ripley 1983, Mundkur *et al.* 1988). Hence, a careful survey of the Gulf of Khambat might yield a few more sightings.

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B.M. PARASHARYA
K.L. MATHEW
A.G. SUKHADIA
AESHITA MUKHERJEE
AINP on Agricultural Ornithology,
Gujarat Agricultural University,
Anand 388 110,
Gujarat, India.

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9. MULTIPLE BROODING OF THE LITTLE BROWN DOVE *STREPTOPELIA SENEGALENSIS*

An instance of multiple brooding by a pair of little brown doves, *Streptopelia senegalensis* Linn. and their incubation rhythm was observed in Bharatpur, Rajasthan, India in 1987-1988. Though multiple brooding is reported in most of the columbids (Westmoreland *et al.* 1986) including *Streptopelia senegalensis* (Ali and Ripley 1983), frequent and continuous brooding by *Streptopelia senegalensis* is so far not reported. The little brown dove reportedly raises two or more broods (Ali and Ripley 1983).

Columbids produce food (crop milk) for the young nestlings *in vivo* and feed older nestlings a diverse diet of seeds. Thus, breeding need not be synchronized with the availability of a particular food. The resultant protracted breeding season has led to a propensity for multiple brooding. Predation, probably, is of secondary importance in the evolution of columbid reproductive strategy (Westmoreland *et al.* 1986).

A pair of little brown doves was observed attempting nest construction over an electric bulb hidden behind a stone pillar on the verandah of my house. The adult birds brought the nesting materials for three days, but could not succeed as there was nothing to hold the nesting materials intact. To help them, I made a cup-like structure with split bamboo sticks and tied it above the electric bulb. Being disturbed, the birds moved to the neighbouring garden about 10 m away and made a nest in a *Capparis sepiaria* bush. Later,

the nest with the eggs was blown away in a dust storm.

A few days later on April 27, 1987, the adults came back and occupied the nest made with bamboo sticks. From April 1987 to March 1988, the same pair of birds used the nest nine times successively for nesting. The nesting was a complete success five times. The eggs were preyed upon once and the hatchlings died on three occasions. Multiple brooding details are given in Table 1.

Nesting behaviour: Both male and female birds actively participated in nest construction. The nest building was carried out for 2 to 3 hrs daily during the day time i.e. 0800 to 0900 hrs in the morning and 1500 to 1600 hrs in the evening. It was noticed that very little nest material was brought (5 to 10 twigs) when an old nest was reused.

Egg laying behaviour: On each nesting occasion, except the second time when only one egg was laid, the eggs were usually laid on succeeding days. If the first egg was laid in the evening the second was laid on the third day (as in the first nest). On all the occasions, except the first and the last, the time lag between first and second egg laying was one day. After laying the first egg, the female left the nest, leaving the egg unguarded. The incubation started immediately after the second egg was laid and thereafter the eggs were never left unguarded; except for a very short duration when the birds changed incubation duty.

Incubation pattern: The adult bird was colour marked while it was incubating. The underside of the tail feather was marked with Indian ink without catching and disturbing the bird. This was done by hiding beneath the nest and marking the underside of the tail feather with a swab dipped in Indian ink. This mark was visible clearly as the underside of the tail feather was white. It was noticed in the preceding nesting that the marked adult was a male. The unmarked adult was noticed laying the egg while the marked male usually incubated the egg during the day. The adult female incubated the eggs during the night and hence incubated for a longer duration. The change of incubating birds was

TABLE 1
DETAILS OF THE MULTIPLE BROODING OF *STREPTOPELIA SENEGALENSIS*

S. No.	Date occupied	Date of nest construction	First egg	Second egg	Hatching date	Leaving date of fledgling	Remark
1	27/04/87	29/04/87	02/05/87	04/05/87	17/05/87 & 18/05/87	01/06/87	Success
2	03/06/87	03/06/87	05/06/87	nil	19/06/87	05/07/87	Success
3	06/07/87	10/07/87	12/07/87	13/07/87	26/07/87	07/08/87	Success
4	08/08/87	11/08/87	16/08/87	17/08/87	01/09/87	nil	Died on 3rd day
5	04/09/87	28/09/87	01/10/87	02/10/87	15/10/87 & 16/10/87	30/10/87	Success
6	01/11/87	15/11/87	20/11/87	21/11/87	nil	nil	Preyed at egg stage
7	11/12/87	17/01/88	20/01/88	21/01/88	03/02/88 & 04/02/88	nil	Died on 4th day
8	08/02/88	13/02/88	15/02/88	16/02/88	29/02/88	nil	Died on 5th day
9	06/03/88	08/03/88	10/03/88	13/02/88	25/03/88	09/04/88	Success

observed between 0800 to 0900 hrs and 1500 to 1600 hrs depending on the season.

The fully fledged young ones left the nest after 9 to 12 days. The total incubation period was 13 to 14 days; a single nesting cycle (from the first egg laying to fledging) was 24 to 26 days. Nene (1979) reported the incubation period of the little brown dove as 13 to 14 days and the full fledged young ones left the nest after 12 to 16 days.

Renesting: It was observed that the nest occupation and construction varied between 0 to 24 days. The next nest occupation occurred within one to two days after fledging (Table 1). The nest construction was completed within two to five days. In mourning doves, after a nesting failure, the period until a new clutch is begun ranges from 2 to 25 days, the most frequent time interval being 6 days. Multiple brooding has been reported in mourning doves *Zenaida macroura*, which often attempts three to six clutches per breeding season (Hansen and Kossack 1963). By reusing old nests, columbids eliminate the time and energy required for building the nest. Mourning doves reuse nests in 35-48% of nesting attempts, but this does not improve nesting success. It is plausible that nest range evolved to reduce time intervals between nesting cycles (McClure 1950, Harris *et al.* 1963, Westmoreland *et al.* 1986). The reuse of an old nest twice by little brown dove has been recorded by Nene (1979), when the nest was reoccupied by adults within five to six days.

Individual columbids may eliminate nesting intervals by overlapping nesting cycles i.e. simultaneously caring for two sets of offspring at different stages of development (Murton and Issacson 1962, Burley 1980). But in the present study, the little brown dove did not have overlapping nesting cycles. It was observed that the same adult pairs reused the nest again and again. The faecal pellets of young ones piled inside the cup-like nest which finally became a platform.

Ali and Ripley (1983) reported that the breeding season of little brown dove is not defined, practically all year, chiefly January to October. Multiple brooding without overlapping is observed and one of the adults was sometimes noticed caring for the young ones as the other one started occupying the nest (1st, 2nd, 3rd and 5th nests).

In birds, the main moult generally follows the breeding season. The burden on the protein reserves of the birds for replacing the feathers is generally too high to accomplish at the same time as breeding. Only with abundant food supply do the two processes seem to occur simultaneously, as in many pigeons (Murton *et al.* 1974). The present study on *Streptopelia senegalensis* showed that adult birds were very weak with arrested moult, probably due to continuous brooding.

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M. JOHN GEORGE
Department of Zoology,
Mar Thoma College,
Perumbavoor 683 542,
Kerala, India.

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10. ASHY MINIVET *PERICROCOTUS DIVARICATUS* (RAFFLES) IN KANHA NATIONAL PARK, MANDLA DISTRICT, MADHYA PRADESH

We were watching a mixed hunting party of birds during a nature trail near Kisli Gate, in Kanha National Park (Mandla district, Madhya Pradesh), early in the morning, on March 19, 1998, when we saw a grey and white minivet, perched right at the top of a sal *Shorea robusta.* Through the binoculars, we saw a long-tailed, bulbul sized bird, which had a prominent white forehead and a very small supercilium. It was otherwise grey on top and on the wings, and white below, immediately recognized as a female minivet *Pericrocotus divaricatus* — the white forehead being the characteristic feature of this bird and a total lack of any red, orange or pink in its plumage, being the other. We got a very good view as the bird was perched in full sunlight and 'co-operated' for at least three to five minutes before it flew off, when we saw some white in its wings. This is the first record of an ashy minivet for Kanha and also the first for Madhya Pradesh.

The only other reports of ashy minivet have been from the Andaman Islands (Butler 1899), Karnala, Maharashtra [31.i.1965 (Navarro 1965)]; Madras, Tamil Nadu [9.xii.1984 (Santharam 1985, 1986, 1988, 1990)]; Thekkady in Periyar Sanctuary, Kerala [17.xii.1989 (Robertson 1992)]; Himachal Pradesh [22.iii.1993 (Khacher 1994)]. Ours is, therefore, only the sixth record of the bird from India. In Madras, however, it is being seen regularly by Dr. Santharam in December and January in the Guindy National Park and Theosophical Society Estate.

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AASHEESH PITTIE
8-2-545 Road No. 7,
Banjara Hills,
Hyderabad 500 034,
Andhra Pradesh, India.
AMITABH PODDAR
187/7, 6th 'A' Cross,
Rajmahal Vilas Extension,
Bangalore 560 080,
Karnataka, India.

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